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THE PROJECTED CABLE-LINE TO THE PHILIPPINES.

BY CHANDLER HALE.

For the last thirty years Congress has from time to time had under consideration the establishment of a trans-Pacific submarine cable. Until recently this plan has never been more than in embryo. But with the rebirth of an Isthmian Canal, as essential to communication between the East and the West, owing to the expansion of commerce, together with our recent acquisition of the Philippines, the Hawaiian group and other islands in the Pacific, the establishment of such a cable in the near future is now rendered imperative. The only questions in doubt are whether the cable should be owned by the Government or by a private company, and whether the route should be by Hawaii, Midway and Guam to Dingala Bay, or by Alaska, Japan, the Loo-Choo Islands and Luzon.

From a technical and engineering point of view, the practicability of a trans-Pacific submarine cable is assured, the Government survey of the route which would connect California and the Philippines, by the Hawaiian Islands, Midway and Guam, showing no obstacles which may not be avoided in laying the cable. More than thirty years ago the idea of a trans-Pacific cable was broached by Cyrus W. Field, but it came to nothing, as the need of such a cable was not then felt. Ocean cabling being in its infancy, and business with the East being at that time limited, the magnitude and cost of the enterprise, together with the grave doubt that was felt as to the probability of successfully laying the cable, frightened capital away from the enterprise. Now, however, after thirty-four years of experience, the practicability of deep-sea cable laying is well established.

The first Atlantic cable, laid in 1858, proved a failure, but in 1866 the attempt was again made and proved successful. Since then sixteen cables have been laid across the Atlantic, four of which are now abandoned. The cable rates in 1866 were ten dollars per word, but this has gradually been reduced to the present rate of twenty-five cents.

The advantages accruing to international commerce from a submarine telegraphic service have been incalculable. In fact, there could be no greater blow to the business of the country than the sudden interruption of all such communication between the United States and Europe.

Such being the case, and since our Government has recently acquired, either by annexation or conquest, new possessions in the Pacific, it seems necessary to create means of communicating with these colonies in the quickest, most direct and most certain manner.

As at present situated, the Government at Washington can communicate with Manila only in the most roundabout way, and its communications are at any point subject to foreign interference. The existing route of cablegrams from Washington to Manila is as follows: To New York by land; to Valentia, Ireland, by cable; to Brighton, England, by cable and land; to Havre, France, by cable; to Marseilles, by land; to Alexandria, Egypt, by cable; to Suez, Egypt, by land; to Aden, Arabia, by cable; to Bombay, India, by cable; to Madras, by land; to Singapore, Malayan Peninsula, by cable; to Saigon, Cochin China, by cable; to Hongkong, by cable; to Manila, Philippine Islands, by cable—the distance being 14,000 miles and the number of transmissions fourteen. And for this communication the Government is now paying about \$400,000 annually for its own messages.

It seems assured that we are henceforth to be permanently and vitally associated with the East; and it would be foolish for us, therefore, to rest satisfied with the means of communication with that part of the world which we are now compelled to employ, when better are at hand, only waiting to be developed. An American cable, whether of Government or private ownership, is now an absolute necessity. The latter would be preferable, though in time of war it should be subject to Government control; as, in general, commercial undertakings should be carried out whenever possible by private enterprise. Cable ownership by the Govern-

ment works out in theory far better than in practice. A cable owned by a Government is necessarily restricted to that Government's possessions, as no Government would permit cables belonging to a foreign Government to land on its shores; otherwise, in time of war, serious international complications might and would arise. All concessions granted by a Government to foreigners involving permission to land upon its shores and do business within its domain make it a *sine qua non* that such foreigners in availing themselves of that privilege shall submit themselves to the jurisdiction of the country which grants the concession.

Take the proposed southern route from San Francisco to Manila, by way of Honolulu, Midway Island and Guam. If it should be owned by the Government, no branch line from Guam to Japan would be possible, because Japan as a nation would not consent to the United States as a nation establishing a cable on the Japanese coast. Nor would such a cable secure any of the business west of Manila. The private cable lines from that point onward could well arrange rates so as to retain all their present business, leaving for the Government line nothing but the business of the Philippines and the Hawaiian Islands, which annually would not amount to more than \$150,000.

The following estimate shows that the cost of such a duplicate trans-Pacific cable system to Manila and to Japan would be at least \$25,000,000:

COST.

9,285 knots cable, including 10 per cent. slack	\$11,583,030
500 knots spare cable.....	623,750
2 cable ships (\$300,000 each).....	600,000
2 sets cable gear.....	250,000
6 stations	180,000
Duplex instruments, battery, etc.....	60,000
Spare instruments	30,000
Travelling expenses, freight, etc.....	100,000
Contingent fund	250,000
Duplicate cable	11,583,030
Total	\$25,259,810

ANNUAL EXPENSE.

Interest at 3 per cent. on \$25,259,810.....	\$757,794
Maintenance and coal supply of two ships.....	250,000
Operating and travelling expenses.....	175,000
Repair and renewal fund	400,000
Total	\$1,532,794

Without the branch line from Guam to Japan, the cost would be about four million dollars less, or \$21,259,810.

On this great investment the receipts of the Government would probably only amount to \$550,000—that is, the saving of the

\$400,000 which is being paid at present in cabling to Manila, and \$150,000 which is estimated to be the commercial cable business of the Philippine and Hawaiian Islands. Thus, from the above estimate of annual expenses and receipts, it will be seen that the Government deficit each year upon its line would exceed double the present cost of its communications to the East.

Hence, the branch line from Guam to Japan, which would largely increase the business of the whole line, by entering into competition with the Indian cables, is necessary from a business point of view to a profitable American line on this route. And this branch line, as already shown, could secure permission from the Japanese Government to land on Japanese territory only if it were established and conducted by private enterprise.

There is a sufficient number of responsible individuals and companies willing and even anxious to secure the permission to establish this entire cable to assure its completion within a reasonable time; they would only ask of the Government in return a subsidy of \$400,000, or rather a guarantee that they would receive that amount annually for the transmission of all Government messages.

Having discussed the feasibility of a trans-Pacific cable owned by the Government, it is worth while to turn to the consideration of the more northern, or Alaskan, route (which has been also surveyed, though not by the Government), as compared with the southern course.

The northern cable route divides itself naturally into six links, of about 800 miles each, a fact which is of very great moment from a constructive point of view, as it would render one type of cable available for all the links, so that any link might be replaced with one reserve cable. The stations proposed on this route are: (1.) Sitka, the capital of Alaska, 803 miles; (2.) Kadiak Island, the farthest station north, in the latitude of Aberdeen, Scotland, 682 miles; (3.) Dutch Harbor, the greatest northern port for the immense Bering Sea gold travel, 770 miles; (4.) Attu, the western end of North America, 810 miles; (5.) the Japanese-Russian border, 858 miles; (6.) northern Japan, 810 miles, whence there are many wires overland, as well as cables to within 200 miles of the Philippines.

Primarily, a cable by way of Alaska to the Philippines, and in addition thereto a separate line from California to Hawaii,

could be laid for about \$12,000,000, as is indicated in the following table:

Route.	Miles.	Single.	Miles.	Duplicated.
		Cost.		Cost.
International cable, U. S. to Asia.....	4,883	\$4,000,000	8,876	\$6,000,000
Same, with cable to Hawaii.....	7,283	6,500,000	12,276	9,200,000
American, northern, to Philippines, via Alaska, with branches to Japan and separate cable to Hawaii.....	9,335	9,000,000	12,735	12,000,000
American, southern, via Hawaii and Guam	7,750	13,500,000	14,250	25,000,000

This surprising difference in cost is largely due to the difference in length of the links. The greater the stretch, the heavier and more costly the cable, with also slight chance of repair in case of interruption. So true is this, that Great Britain has been deterred from connecting Canada and Australia, as the first link from Vancouver to Fanning Islands would exceed 3,500 miles in length.

The arguments against such a route are to be found in the great natural difficulties to be encountered—fog, ice and great depths. The North Pacific is not as stormy, cold and foggy as the North Atlantic. The worst fogs lie immediately south of the Aleutian Islands, but the cable would not be laid there. It would pass to the north of these islands, where there is much less fog. A cable on the northern route could be repaired at any time of the year on any link, except during temporary storms, and the cable-ship could always find a harbor within one hundred miles of any break.

By the northern route, the different stretches vary but slightly in distance, and are all comparatively short, none exceeding 850 miles; so that, in case of a break, one cable-ship, if it were found impossible to make repairs, could easily relay one entire stretch, the cost of which would not amount to more than \$600,000.

Not so on the southern route, with its four great stretches of 2,286, 1,254, 2,593 and 1,496 miles. With these the cost of a break in a great depth, in case repair were possible, would probably amount to several hundred thousand dollars, with the likelihood also of a necessity for the renewal of an entire stretch, which would cost from two to three millions. So far, the maximum depth from which a cable has been raised for repair is 2,700 fathoms, a depth which on the southern route is far exceeded in many spots. The greater the depth, the greater the pressure and strain upon the cable, and the greatest depths would be the spots where breakage would probably occur.

That interruptions (breaks) are frequent is shown by the following table:

LIST OF INTERRUPTIONS.

1887.....	2 out of 7 cables were broken at one time, leaving 5.
1888.....	2 out of 7 cables were broken at one time, leaving 5.
1889.....	3 out of 7 cables were broken at one time, leaving 4.
1890.....	2 out of 7 cables were broken at one time, leaving 5.
1891.....	3 out of 7 cables were broken at one time, leaving 4.
1892.....	2 out of 7 cables were broken at one time, leaving 5.
1893.....	3 out of 7 cables were broken at one time, leaving 4.
1894.....	4 out of 7 cables were broken at one time, leaving 3.
1895.....	3 out of 7 cables were broken at one time, leaving 4.

The Anglo-American cable, laid in 1869, lived only 24 years. In that time there were 20 interruptions, of which the longest was of ten months' duration, and, roughly speaking, the cable was interrupted five and one-half years out of the twenty-four, the repairs costing over £300,000, or \$1,500,000.

The three Atlantic cables of the Commercial Company's system, the first of which was laid in 1884, have been interrupted 78 times.

If we now return to the so-called Arctic route, its most northern station on the direct line is Kadiak, in the latitude of Aberdeen, Scotland. The lowest temperature there recorded in twenty years' observations was five degrees above zero. Florida has had the mercury lower than that within the past five years. The average winter temperature of Kadiak is as high as that of the District of Columbia. The climate of the other stations is similar. Dutch Harbor lies in the latitude of Liverpool; Sitka in the latitude of Glasgow and between the same isothermals; Attu is as warm as the other stations. Dutch Harbor was once inclosed by ice for a few days in the spring of 1864. The Asiatic coast is colder than Alaska, but at Petropavlovsk, which is 120 miles north of the first Asiatic station, the harbor is never blocked by ice. These few facts present a far milder picture than any that might be drawn of the Newfoundland Banks and the northern Atlantic, where sixteen cables have been laid.

The northern cable would be laid along a gradually shelving coast. Any depth desired could be picked out, from 500 fathoms to 2,000. It is proposed to keep between 500 and 1,500, so that the average would not exceed 1,000. The opportunity for this choice of depths continues from Cape Flattery to Dutch Harbor. Beyond Dutch Harbor, on the north of the Aleutian Islands, the depth averages 2,000 fathoms. From Attu to the Asiatic main-

land is the deepest stretch on this course, reaching 2,200 fathoms. To avoid exceeding this depth the route has to run north of the Commander Islands (Russian), and this involves an increase in the distance (which is allowed for in the estimates); but the line thus keeps clear of a deep ocean hole which lies southwest of Attu. Southward to Japan, the mean depth is 800 fathoms, and nowhere does the depth exceed 1,500 fathoms.

On the southern route, no choice of depths is possible. There is no sloping shelf. Between San Francisco and Hawaii the mean depth is 2,500 fathoms, with a maximum of 3,073; between Hawaii and Midway Island the mean depth is 2,000, the maximum 3,026; from Midway Island to Guam the mean depth is 2,600, with a maximum of 4,900, and with sudden and great fluctuations; from Guam to Luzon the average depth is 2,200, the maximum 3,400.

It is argued that by the northern route several landings would be necessary on Japanese territory before reaching Manila, and so the exclusively American character of the cable could not be maintained. This is true, but the same difficulty would be met with on the southern line, because of the branch from Guam to Japan, which, as has been shown, would be necessary from a financial point of view, the cable business of the Philippine and Hawaiian Islands being so limited.

The only objection that can be made to the northern route is that it does not include the island of Guam. However, if Guam is considered of sufficient importance to require a cable of its own, \$1,000,000 will lay a slow cable from the Philippines to it.

In distance, the southern exceeds the northern route by twenty-three per cent. On the former line there are no natural stations, and it runs through the greatest uninhabited waste of water on the globe.

From a strategic point of view, a comparison between Dutch Harbor and Hawaii gives significant results. Dutch Harbor is 2,000 miles nearer coal mines; it is 50 miles nearer San Francisco; it is 720 miles nearer the United States; it is 783 miles nearer the Philippines; it is as near to Guam; it is 2,500 miles nearer Japan; it is 900 miles nearer Yokohama; it is 1,020 nearer Shanghai; it is 600 nearer Hongkong; it is 1,260 nearer Vladivostok; it is 450 miles nearer Singapore; it is almost as near Australia, and it is a shorter route from Panama to Asia. These

are direct distances. By cable routes the comparison is still more favorable to Dutch Harbor.

A map with concentric distance circles will show that Dutch Harbor is the great central port of the north Pacific, and that Hawaii is the most out-of-the-way place in the northern hemisphere.

At Dutch Harbor there is a deep and commodious harbor, with coal mines not far away now being operated. Hawaii has no coal.

As we have entered upon a policy of annexation and colonization, which must lead to the widest competition with the other Great Powers, let us prepare for the future. If England owned Dutch Harbor she would make it a great stronghold. Our Government should do the same. By so doing, we should sandwich Great Britain between Puget Sound on the south and Dutch Harbor on the west, thus at any time controlling communication between Canada and the East. With a cable to Dutch Harbor and a fleet there, we should be half way to any place in the northern Pacific.

Our Government, as previously stated, is now paying for cable communication with the Philippines about \$400,000 annually, or by the present roundabout route \$2.25 per word. More than three-fourths of this amount is expended by the War Department, and is directly due to the state of war now existing there. With the suppression of the rebellion such expense will be greatly reduced, probably more than fifty per cent.; and yet a private company which should lay and own the southern route would insist upon a Government subsidy of \$400,000 for twenty years, or rather upon a guarantee that it would receive that amount for transmitting all Government messages, even though the route would be much shorter than the one used at present, and would probably be operated in time of peace.

By the northern route, which would be 2,500 miles shorter from London to Yokohama than by the Indian cables, thus producing competition and lowering the rates, the Government could send its messages, not at so much per year, but at so much per word.

CHANDLER HALE.